

Complete Levine Citations as Found by the Government

In our response to the government's 5-24 response, we stated: *"After extensive research, we have found no independent academic papers that validate the Levine Formula or methodology. We have provided the court with an academic paper by a Freenet developer, Dr. Babenhauserheide, stating that the Formula employs wrong math, wrong model, and wrong false positives. The government states that Dr. Levine's 2017 and 2020 papers have been cited in numerous peer reviewed academic papers, (Govt. Reply, p.12). We request copies of the same."* We requested a list of these peer reviewed papers, and the government responded with the following list;

1. Novel and practical SDN-based traceback technique for malicious traffic over anonymous networks Z Ling, J Luo, D Xu, M Yang, X Fu - IEEE INFOCOM 2019-IEEE ..., 2019 - ieeexplore.ieee.org
2. A Forensically Sound Method of Identifying Downloaders and Uploaders in Freenet BN Levine, M Liberatore, B Lynn, M Wright - Proceedings of the 2020 ..., 2020 - dl.acm.org
3. Short text classification approach to identify child sexual exploitation material MW Al-Nabki, E Fidalgo, E Alegre... - arXiv preprint arXiv ..., 2020 - arxiv.org
4. Classification of Freenet Traffic Flow Based on Machine S Lee, S Shin, B Roh - Journal of Communications, 2018 - jocm.us
5. A Survey of Privacy Protection and Network Security in User On-Demand Anonymous Communication Y He, M Zhang, X Yang, J Luo, Y Chen - IEEE Access, 2020 - ieeexplore.ieee.org
6. Anonimlik ile illegalite Arasında: Deep Web, Dark Web ve Devlet dışı silahlı aktörlerin uluslararası siber faaliyetleri G Sönmez, E Çelik - Güvenlik Çalışmaları Dergisi, 2020 - dergipark.org.tr
7. Increasing the Efficacy of Investigations of Online Child Sexual Exploitation BN Levine - 2022 - read-me.org
8. A Survey on Anonymous Communication Systems Traffic Identification and Classification R Wang, Y Zhao - 2021 3rd International Conference on Advanced ..., 2021 - dl.acm.org
9. Fundamental design issues in anonymous peer-to-peer distributed hash table protocols TA Baumeister - 2019 - search.proquest.com
10. Network Infrastructures in the Dark Web OMS Teixeira - 2021 - search.proquest.com

Of these 10 documents, 2 were written by Dr. Levine. Doc. #2 is the 2020 Levine paper, #7 is a report by Dr. Levine to the DOJ on child pornography. This is a report, not a peer reviewed academic paper.

With the other documents, we include here the complete references to Levine and the Levine Formula. By complete reference, we mean that this was all that was said in the document about Levine or the Levine Formula. There was no attempt to verify or test the Formula in any of the papers. None of these papers claim that the Formula is valid.

Doc. #1 complete reference is: *"Illegitimate users exploit Tor to send spams, download copyrighted or illegal materials such as child pornography [8], and even deploy botnet Command and Control servers*

(C&C) [12]" (pg.1). The [8] reference is to the Levine paper. There is no mention of the Levine methodology in this paper.

Doc. #3 complete reference is: *"Darknets, such as The Onion Router (Tor)¹ [3, 4, 5] and FreeNet² [6] and also Peer to Peer (P2P) networks, like eDonkey, [7, 8] are environments where the interchange of CSEM seem to proliferate, thanks to the high level of privacy and anonymity provided to their users."* [6] is the reference to Levine. There is no mention of Levine in this paper.

Doc. #4 complete reference is: *"Levine et al. [12] proposed a passive technique for detecting Freenet downloaders. They derived a Bayesian framework for testing whether a peer may be downloading a document, based on counting the requests observed. This can determine if the node is the Original Requester or the relay node that requested the data. It requires only single node, but must own the manifests to monitor in advance"* They make no claim that the Levine method works, they did not test the Levine method, and only stated that Levine proposed an approach. There were no other references to Levine.

Doc. #5 complete reference is: *"For example, Levine et al. [69] monitor the traffic information of neighbor nodes by the characteristic of the fixed HTL value when the sender initiates communication, and it uses Bayesian methods to judge whether a user is the sender."* No further reference to the Levine method or testing is made in this paper. Levine offers proof in the 2020 paper that the HTL cannot be used to identify a downloader.

Doc. #6 complete reference is: translated from Turkish *"Although it does not serve through an anonymous channel, it only allows sharing of previously published content to the extent that people allow each other (Levine, Liberatore, Lynn, & Wright, 2017, p.1). The founders of FreeNet stated this situation; Freedom of communication is in democratic societies. It is a core value". (p.77).*

Doc. #7 complete reference is: This is not an academic paper but a report to the Department of Justice (**NCJ Number:301590**) By Dr. Brian Levine. This report references 12 other papers by Dr. Levine.

Doc. #8 complete reference is: This paper is hosted by the acm and is not available to non members. We have not found an accessible version of the paper.

Doc. #9 Complete reference is: *"In 2017, Levine, Liberatore, Lynn, and Wright [47] used a statistical attack to determine if the previous node in a routing path was the original sender or a forwarding router. The attack only required a single passive peer to carry out, and it achieved a false positive rate of about 2% in experiments. The attack worked on the assumption that large files were split up into smaller and more manageable blocks, and that the original sender would evenly distribute its file block requests among all its peers."* The key point here is the assumption that *requests are evenly distributed*. Corbett and the other cases prove that this assumption is not valid. This paper does not validate the Levine Formula; it only repeats Levine's statements.

Doc. #10 complete reference is: *"Another study presented in May 2017 explores a technique to tell if a neighbor node is the receiver of a file or if he is just forwarding the requests to other nodes [14]. This*

study uses a Bayesian framework that allows a passive node just by analyzing the traffic to determine if its neighbor is the one downloading a file or not." This is the extent of the Levine reference and it does not validate.